Progress Toward Standards

Grade 5

Mathematics

Framework

1/13/03

Strand 1: Numbers and Operations

Standard 1.1: Students demonstrate understanding of number concepts.

In the grade 5 test, understanding is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- reading and writing whole numbers through trillions
- recognizing place value in decimals
- rounding whole numbers and decimals to specified place value positions
- recognizing and generating fractional and decimal equivalents for commonly used fractions
- ordering commonly used fractions and decimals through thousandths with and without models
- recognizing prime and composite numbers
- findingcommon multiples and common divisors

Standard 1.2: Students demonstrate an understanding of the concepts of operations.

In the grade 5 test, understanding is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- recognizing the relationships among the four operations on whole numbers
- applying the commutative, associative, identity, and distributive properties
- relating addition, subtraction, and multiplication of fractions to pictorial models or real-life situations

Standard 1.3: Students demonstrate fluency in computing and estimating.

In the grade 5 test, fluency is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- multiplying and dividing with whole numbers and money
- solving multi-step problems involving whole numbers and money
- adding and subtracting decimals through thousandths
- solving fraction and decimal problems based on models, number sense, or estimation
- estimating based on operations described above

Strand 2: Algebra

Standard 2.1: Students demonstrate understanding of patterns, relations, and functions.

In the grade 5 test, facility is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- finding designated terms in a numeric or geometric pattern
- representing rules for numeric patterns using words, symbols, or simple algebraic expressions

Standard 2.2: Students demonstrate the ability to use algebraic symbols to represent and analyze situations.

In the grade 5 test, understanding is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- representing linear real life situations with simple algebraic expressions or equations
- using inspection to find the solution to a simple linear equation
- solving problems such as balance scale problems that serve as readiness activities for equation solution using algebraic methods
- finding numerical replacements for variables, represented by a symbol or letter, to make number sentences true

Standard 2.3: Students demonstrate the ability to create models to represent mathematical relationships.

In the grade 5 test, ability is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- recognizing and creating various representations (e.g., words, tables, and graphs) of simple linear real-life situations

Standard 2.4: Students demonstrate an understanding of change in a variety of situations.

In the grade 5 test, understanding is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- matching a situation involving a constant rate of change to a table or graph that best represents the situation

Strand 3: Geometry

Standard 3.1: Students demonstrate understanding of two- and three-dimensional geometric shapes and the relationships among them.

In the grade 5 test, understanding is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- using properties to describe and identify 2- and 3-dimensional figures
- reasoning about geometric figures based on their definitions and properties, e.g., a square is also a rectangle and a parallelogram
- representing points, lines, line segments, rays, and angles with models and symbols
- recognizing the results of subdividing and combining shapes
- recognizing congruent figures, including shapes that have been rotated or reflected

Standard 3.2: Students demonstrate understanding of coordinate systems.

In the grade 5 test, understanding is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- using ordered pairs as coordinates of points in first quadrant of a coordinate plane

Standard 3.3: Students demonstrate understanding of symmetry and transformations.

In the grade 5 test, understanding is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- identifying a symmetric figure and determining all its lines of symmetry
- identifying figures with rotational symmetry and determining the types of turns that result in matches to original figure
- identifying the result of translating (sliding), reflecting (flipping), or rotating (turning) a geometric figure
- describing translations, reflections, and rotations including the use of terms such as *horizontal, vertical, counterclockwise,* 90º, and 180º

Standard 3.4: Students demonstrate an ability to perform visual and spatial reasoning.

In the grade 5 test, ability is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- identifying a net (pattern) of a 3-dimensional figure such as a cube or square prism
- identifying views (e.g., front, top, right side) of a structure built from cubes

Strand 4: Measurement

Standard 4.1: Students demonstrate understanding of concepts and processes of measurement.

In the grade 5 test, understanding is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- selecting the best unit to use relative to the purpose of the measurement as well as the type of measurement
- selecting the correct unit (linear, square, or cubic) to use for linear, area, or volume measurement
- recognizing the relationship between the size of the number in a measurement and the size of the unit used
- recognizing that a change in perimeter or area of a polygon may or may not change the other measurement
- recognizing 90º angles as well as angles with measures greater than or less than 90º
- performing conversions between pairs of the following: inches, feet, yards and miles; millimeters, centimeters, meters, and kilometers; cups, pints, quarts, and gallons; milliliters and liters; ounces and pounds; grams and kilograms; minutes, hours, days, weeks, months, and years
- making reasonable estimates of length, capacity, weight, or temperature for a given object or situation

Standard 4.2: Students demonstrate facility with the tools, procedures, and formulas of measurement.

In the grade 5 test, understanding is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- using rulers to measure lengths to the nearest inch, half inch, quarter inch, eighth inch, centimeter, or millimeter
- solving problems involving lapsed time, thermometers, and scales
- finding the perimeter of a polygon
- finding the area of a rectangle or of a region that can be subdivided into rectangles
- finding the volume of a prism composed of unit cubes

Strand 5: Data Analysis and Probability

Standard 5.1: Students demonstrate facility in collecting, organizing, and displaying data.

In the grade 5 test, facility is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- selecting questions to be asked and groups to be surveyed for a given purpose
- collecting and organizing data, e.g, using charts, tally charts, and organized lists
- reading and constructing bar graphs, pictographs, line graphs, and line plots

Standard 5.2: Students demonstrate an understanding of statistical methods.

In the grade 5 test, understanding is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- calculating the mean, median, mode, and range of a data set and interpreting their meanings relative to the data set
- making judgments regarding the shape and spread of data sets

Standard 5.3: Students demonstrate the ability to draw conclusions and make inferences based on data.

In the grade 5 test, ability is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- drawing conclusions and making inferences and predictions based on data given in charts or graphs

Standard 5.4: Students demonstrate an understanding of probability.

In the grade 5 test, understanding is demonstrated with the following indicators as well as by solving problems, reasoning, communicating, representing, and making connections based on the indicators—

- finding all possible outcomes of an experiment using a simple tree diagram or an organized list
- predicting the number of successes in multiple trials of a simple experiment, e.g., in experiments involving drawing colored marbles from a bag containing a given number of marbles of each color